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EXAMINER

NGUYEN, LUONG TRUNG

ART UNIT

PAPER NUMBER

2622

NOTIFICATION DATE

DELIVERY MODE

06/09/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction25944@oliff.com
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Office Action Summary

Application No.

10/656,726

Applicant(s)

UTAGAWA, KEN

Examiner

LUONG T. NGUYEN

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-28 and 31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-28, 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species VII, Figure 29, in the reply filed on 02/07/2007 is acknowledged.

Response to Arguments

2. Applicant's arguments filed on 03/23/2011 have been fully considered but they are not persuasive.

In re pages 6-7, the Applicant argues that the combinations of applied references Glenn in view of Nishiki fail to disclose, and would not have rendered obvious, the plurality of vertical CCDs have two transport electrodes ... an arrangement of the transport electrodes in even number arrays is out of phase and reverse to an arrangement of the transport electrodes in odd number arrays, as recited in claim 20, and similarly recited in claim 31.

In response, regarding claim 20, the Applicant amended claim 20 with limitation "an arrangement of the transport electrodes in even number arrays is out of phase and reverse to an arrangement of the transport electrodes in odd number arrays." The Examiner considers that Glenn in view of Nishiki et al. do disclose the limitation "an arrangement of the transport electrodes in even number arrays is reverse to an arrangement of the transport electrodes in odd number arrays." Nishiki et al. discloses the respective transfer electrodes (for example, K11 to K41 and K21 to K24) of mutually adjacent vertical CCD parts V1 to V5 are crossed and connected for every four electrodes. Accordingly, when, for example, driving pulses $\Phi 1$ to $\Phi 4$

are given to the transfer electrodes K11 to K41, conversely (i.e., reversely) given to the transfer electrodes K21 to K24 are driven pulses $\Phi 4$ to $\Phi 1$, see figures 1-2.

Claim Objections

3. Claim 31 is objected to because of the following informalities:

Claim 31 (lines 14-15), "in even arrays" should be changed to --in even number arrays--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 20-28 and 31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 20 and 31 are amended with newly added limitation "an arrangement of the transport electrodes in even number arrays is out of phase and reverse to an arrangement of the transport electrodes in odd number arrays," which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification, figure 29

do disclose “an arrangement of the transport electrodes in even number arrays is reverse to an arrangement of the transport electrodes in odd number arrays,” but does not have the support for newly added limitation “an arrangement of the transport electrodes in even number arrays is out of phase”.

For the purpose of examination, the Examiner will read this limitation as “an arrangement of the transport electrodes in even number arrays is reverse to an arrangement of the transport electrodes in odd number arrays.”

Claims 21-28 are rejected as being dependent from claim 20.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 31 is rejected under 35 U.S.C. 102(b) as being anticipated by Nishiki et al. (JP 03-119875).

Regarding claim 31, Nishiki et al. discloses an imaging device comprising:

a plurality of photosensors two-dimensionally arranged on a light-receiving surface, for generating photo signals in accordance with an amount of received light (see figure 1);

a plurality of vertical CCDs (vertical CCDs V1 to V5, figure 1) provided between arrays of said plurality of photosensors in a vertical direction on the light-receiving surface, for vertically transporting the photo signals outputted from said photosensors;

first horizontal transport parts (horizontal CCDs H1, H2, figure 1) provided at one ends of said vertical CCDs, for horizontally transporting the photo signals outputted from the one ends; and

second horizontal transport parts (horizontal CCDs H3, H4, figure 1) provided at the other ends of said vertical CCDs, for horizontally transporting the photo signals outputted from the other ends, wherein:

said plurality of vertical CCDs have two transport electrodes for each of said photosensors, and every two pairs of the two transport electrodes for the photosensors have electrically crosswise connection to each other, the photosensors being adjacent to each other in a horizontal direction, and an arrangement of the transport electrodes in even number arrays is reverse to an arrangement of the transport electrodes in odd number arrays (the transfer electrodes (for example, K11 to K41 and K21 to K24) of mutually adjacent vertical CCD parts V1 to V5 are crossed and connected for every four electrodes. Accordingly, when, for example, driving pulses $\Phi 1$ to $\Phi 4$ are given to the transfer electrodes K11 to K41, conversely (i.e., reversely) given to the transfer electrodes K21 to K24 are driven pulses $\Phi 4$ to $\Phi 1$, see figures 1-2).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn (US 7,230,646) in view of Nishiki et al. (JP 03-119875).

Regarding claim 20, Glenn discloses an imaging device comprising:

a plurality of photosensors included in one image sensor and two-dimensionally arranged on a light-receiving surface (an image sensor 60 included in a single sensor electronic camera, figures 1-3, column 2, lines 14-67), for generating photo signals in accordance with an amount of received light;

a readout section reading out the generated photo signals (a read out reading section is included in image sensor 60 for reading out the image signals), wherein:

said readout section selectively has a grid imaging mode (figures 2-3 show image sensor 60 in grid mode, column 2, lines 30-67) in which the generated photo signals on the light-receiving surface are sampled in a grid pattern for readout, and a diagonal grid imaging mode (figures 4-5 show image sensor 60 in diagonal grid mode, column 3, lines 7-30) in which the generated photo signals on the light-receiving surface are sampled in a diagonal grid pattern for readout;

a direction of a grid pattern of sampling points in the grid imaging mode and a direction of a grid pattern of sampling points in the diagonal grid imaging mode are different from each

other (figures 2-3 show an image sensor 60 in grid mode, in which red or blue is sampled in horizontal or vertical direction, see column 2, lines 30-40; figures 4-5 show an image sensor 60 in diagonal grid mode, in which red or blue or green is sampled in diagonal direction, see column 3, lines 22-30; this shows the direction of grid imaging mode and diagonal grid imaging mode are different from each other).

Glenn fails to disclose the readout section includes a plurality of vertical CCDs provided between arrays of the plurality of photosensors in a vertical direction on the light-receiving surface, for vertically transporting photo signals output from the photosensors;

the plurality of vertical CCDs have two transport electrodes for each of the photosensors, and every two pairs of the transport electrodes for the photosensors have electrically crosswise connection to each other, the photosensors being adjacent to each other in a horizontal direction, and an arrangement of the transport electrodes in even number arrays is reverse to an arrangement of the transport electrodes in odd number arrays.

However, Nishiki et al. discloses a solid-state image pickup element comprising:

the readout section includes a plurality of vertical CCDs provided between arrays of the plurality of photosensors in a vertical direction on the light-receiving surface, for vertically transporting photo signals output from the photosensors (see figures 1-2);

the plurality of vertical CCDs have two transport electrodes for each of the photosensors, and every two pairs of the transport electrodes for the photosensors have electrically crosswise connection to each other, the photosensors being adjacent to each other in a horizontal direction, and an arrangement of the transport electrodes in even number arrays is reverse to an arrangement of the transport electrodes in odd number arrays (the transfer electrodes (for

example, K11 to K41 and K21 to K24) of mutually adjacent vertical CCD parts V1 to V5 are crossed and connected for every four electrodes. Accordingly, when, for example, driving pulses $\Phi 1$ to $\Phi 4$ are given to the transfer electrodes K11 to K41, conversely (i.e., reversely) given to the transfer electrodes K21 to K24 are driven pulses $\Phi 4$ to $\Phi 1$, see figures 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Glenn by the teaching of Nishiki in order to a solid-state image pickup element in which distances for transferring the charges from the plural vertical CCD to the most distant horizontal CCD is made short and the defect of the transfer can be widely improved (see constitution).

10. Claims 20, 21, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Esser et al. (US 4,799,109) in view of Nishiki et al. (JP 03-119875).

Regarding claim 20, Esser et al. discloses an imaging device comprising:

a plurality of photosensors included in one image sensor and two-dimensionally arranged on a light-receiving surface (image sensor 1, figures 1-2, column 3, lines 20-67), for generating photo signals in accordance with an amount of received light;

a readout section (reading means 9, figure 2, column 4, lines 1-4) reading out the generated photo signals,

wherein said readout section selectively has a grid imaging mode (figure 9 shows image sensor 1 in grid mode, column 7, lines 1-50) in which the generated photo signals on the light-receiving surface are sampled in a grid pattern for readout, and a diagonal grid imaging mode (figure 10 shows image sensor 1 in diagonal grid mode, column 7, lines 50-67) in which the

generated photo signals on the light- receiving surface are sampled in a diagonal grid pattern for readout;

a direction of a grid pattern of sampling points in the grid imaging mode and a direction of a grid pattern of sampling points in the diagonal grid imaging mode are different from each other (figure 9 shows image sensor 1 in grid mode, in which direction is in horizontal or vertical, column 7, lines 1-50; figure 10 shows image sensor 1 in diagonal grid mode, in which the direction is in diagonal, column 7, lines 50-67).

Esser et al. fails to disclose the readout section includes a plurality of vertical CCDs provided between arrays of the plurality of photosensors in a vertical direction on the light-receiving surface, for vertically transporting photo signals output from the photosensors;

the plurality of vertical CCDs have two transport electrodes for each of the photosensors, and every two pairs of the transport electrodes for the photosensors have electrically crosswise connection to each other, the photosensors being adjacent to each other in a horizontal direction, and an arrangement of the transport electrodes in even number arrays is reverse to an arrangement of the transport electrodes in odd number arrays.

However, Nishiki et al. discloses a solid-state image pickup element comprising:

the readout section includes a plurality of vertical CCDs provided between arrays of the plurality of photosensors in a vertical direction on the light-receiving surface, for vertically transporting photo signals output from the photosensors (see figures 1-2);

the plurality of vertical CCDs have two transport electrodes for each of the photosensors, and every two pairs of the transport electrodes for the photosensors have electrically crosswise connection to each other, the photosensors being adjacent to each other in a horizontal direction,

and an arrangement of the transport electrodes in even number arrays is reverse to an arrangement of the transport electrodes in odd number arrays (the transfer electrodes (for example, K11 to K41 and K21 to K24) of mutually adjacent vertical CCD parts V1 to V5 are crossed and connected for every four electrodes. Accordingly, when, for example, driving pulses $\Phi 1$ to $\Phi 4$ are given to the transfer electrodes K11 to K41, conversely (i.e., reversely) given to the transfer electrodes K21 to K24 are driven pulses $\Phi 4$ to $\Phi 1$, see figures 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Esser et al. by the teaching of Nishiki et al. in order to a solid-state image pickup element in which distances for transferring the charges from the plural vertical CCD to the most distant horizontal CCD is made short and the defect of the transfer can be widely improved (see constitution).

Regarding claims 21, 25, Esser et al. discloses wherein:

said plurality of photosensors are arranged in a grid pattern on the light-receiving surface (figure 9); and

in the diagonal grid imaging mode said readout section adds up the photo signals for readout in each area around a crosspoint of the diagonal grid pattern (figure 10, the pixels in lines 3 and 4 are read together, column 7, lines 50-65).

11. Claims 22, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable Esser et al. (US 4,799,109) in view of Nishiki et al. (JP 03-119875) further in view of Gallagher et al. (US 6,765,611).

Regarding claims 22 and 26, Esser et al., Nishiki et al. fail to specifically disclose an optical low pass filter disposed on the light-receiving surface, for blurring an optical image in a direction substantially perpendicular to an adding-up direction of the photo signals. However, Gallagher et al. teaches an optical low pass filter 6, which is placed between lens and image sensing device 10, performs a slight blurring of the imaged light (figure 1, column 4, lines 19-25). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Esser et al. and Nishiki et al. by the teaching of Gallagher et al. in order to reduce the occurrence of alising (column 4, lines 20-25).

12. Claims 23, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable Esser et al. (US 4,799,109) in view of Nishiki et al. (JP 03-119875) further in view of Morris et al. (US 6,665,010).

Regarding claims 23, 27, Esser et al., Nishiki et al. fail to specifically disclose a color filter array disposed on the light-receiving surface such that the photosensors in each unit of the adding-up substantially have a same color. However, Morris et al. teaches an imager 140, which is spatially divided into multiple (four, for example) groups 113 (groups 113a, 113b, 113c, 113d), one group 113 may be associated with red color and one group 113 may be associated with a green pixel color (figure 5, column 3, lines 5-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Esser et al. and Nishiki et al. by the teaching of Morris et al. in order to independently control integration times for different groups of pixels sensing unit that optimizes the dynamic range of the captured image (column 3, lines 25-30).

13. Claims 24, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable Esser et al. (US 4,799,109) in view of Nishiki et al. (JP 03-119875) further in view of Tanaka (US 6,982,751).

Regarding claims 24, 28, Esser et al., Nishiki et al. fail to specifically disclose a color filter array disposed on the light-receiving surface such that the photosensors in each unit of the adding-up have different colors from each other. However, Tanaka discloses a solid-state imaging apparatus and its driving method in which the signal charges read for every 2 pixels are added in the vertical transfer block 53 have different colors from each other (figure 14, column 16, lines 14-20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Esser et al. and Nishiki et al. by the teaching of Tanaka in order to provide a CCD imaging device that can be operated in the two modes of the frame read mode and the special read mode (column 16, lines 33-45).

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571)272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID L. OMETZ can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LUONG T NGUYEN/
Primary Examiner, Art Unit 2622
06/03/11

